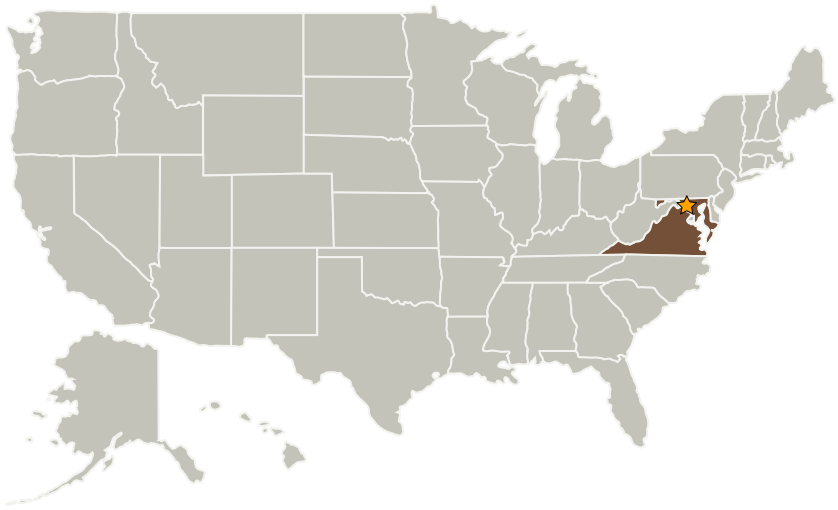
Active Noise Sources, Phase I

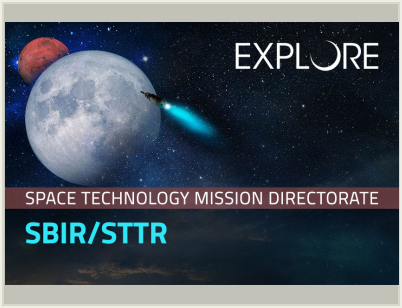
Completed Technology Project (2009 - 2009)

Project Introduction

Microwave radiometry is a well-known and extremely useful method to study the chemistry and dynamics of the Earth's atmosphere. For accurate long term measurements, the calibration and stability of the radiometer is of primary importance. Thus, the noise-injection radiometer (NIR), which greatly reduces drifts due to gain and noise figure variation in the receiver system, is highly preferred. The NIR architecture requires an electronic noise injection system consisting of a noise diode, a switch and a coupler to inject the noise into the signal waveguide. NIRs are now commonly used at lower frequency, but above about 100 GHz the noise diodes become much more difficult to achieve. Recently, VDI has measured significant ENR above 100 GHz from GaAs Schottky barrier diodes. This preliminary measurement with a non-optimized diode design, coupled with the fact that the VDI diodes have been used as mixers and multipliers to well over 1 THz, offers some promise that GaAs diodes can be used to achieve useful noise power levels to well above 100 GHz. Thus, the focus of this Phase 1 proposal is the investigation of noise diodes and noise sources based on GaAs Schottky diode technology for noise-injection radiometer systems above 100 GHz.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Virginia Diodes, Inc.	Supporting Organization	Industry	Charlottesville, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies